stars whose brightness is greater than that corresponding to magnitude zero, and suggests instead the word *supermagnitude.* The sun, therefore, becomes 26.59 supermagnitude. This value is based upon the Potsdam magnitudes of Polaris, Alpha Canis Min., and Sirius, which are 2.15, 0.56 and —1.09. The corresponding Harvard magnitudes are 2.12, 0.48 and —1.58, the use of which would, of course, have led to slightly different results. The sun sends us about seventeen billion times as much light as Sirius, the brightest star in the heavens.

RECENT AND COMING TOTAL ECLIPSES OF THE SUN.

THE total eclipse of August 30, 1889, was in many respects a favorable one. Skilled observers from various countries took up stations at so many widely separated places along the belt of totality, that the phenomenon could not well escape them all. Although clouds prevented observations in Labrador, elsewhere—in Spain, Algeria and Egypt—observations and photographs were obtained, which should increase substantially our knowledge of the sun, when the results have been reduced and compared.

Professor David P. Todd and Mr. R. H. Baker, of the Amherst Observatory, have issued a pamphlet, calling attention to the next favorable eclipse. Although there will be six total eclipses during the next six years, that of January 13–14, 1907, seems to be most favorable. This eclipse, however, presents some difficulties, since the track of totality lies in Turkestan and Mongolia. Nevertheless, it will doubtless be observed by some enthusiastic astronomers. The duration of totality will be about two minutes.

S. I. BAILEY.

FLUID LENSES.

A REPORT from Consul-General W. A. Rublee, at Vienna, states that after experiments extending over a number of years a Hungarian chemist has succeeded in producing optical lenses by a simple and cheap process that are not only quite as good as the best massive glass lenses at present used, but that can be manufactured of a size three times as great as the largest homogeneous glass lens heretofore made.

The importance of this invention in the field of astronomy is obviously very considerable. The largest glass lens heretofore manufactured out of massive glass for astronomical purposes has a diameter of about 1.50 meters, and it required several years to make it, while the price was several hundred thousands of marks. Such a lens can be manufactured by the new process in a few weeks at a cost of 2,000 or 3,000 marks. The price of a glass lens of the best German manufacture, with a diameter of 25 centimeters, is now about 7,000 marks, whereas the price of a similar lens made by the new process is about 150 marks. Lenses of smaller diameter for photographic purposes, for opera glasses, reading glasses, etc., can be produced at correspondingly smaller cost. The lens consists of a fluid substance inclosed between two unusually hard glass surfaces, similar to watch crystals, in which the refractive power and other characteristic properties are so chosen that the glass surfaces not only serve to hold the fluid, but also combine with the fluid to overcome such defects as are scarcely to be avoided in ordinary lenses. It is for this reason also that the lens is achromatic.

The fluid contained in the lens is hermetically closed, so that no air can enter and exercise a damaging effect. The fluid does not evaporate, and its composition is such that its properties are not affected by time or by temperature. The coefficient of expansion, both of the glass and of the fluid, is approximately the same between the temperatures of 15 degrees of cold and 60 degrees of heat. Another advantage of the lens is that, on account of the fact that the fluid is not dense and the glass crystals are thin, the whole lens combination through which the light must penetrate is very slight.

These fluid lenses are already manufactured in Austria, and are attracting attention both on account of their utility and the small price at which they are sold. Patents have been taken out in other countries, and they are soon to be introduced.